



028723-385.ST25

## SEQUENCE LISTING

<110> Tobin, Allan J.  
Erlander, Mark G.  
Kaufman, Daniel L.

<120> Cloned Glumatic Acid Decarboxylase

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<140> US 10/641,149  
<141> 2003-08-15

<150> US 07/586,536  
<151> 1990-09-12

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tct ggg gat cct gag aac ccg gga aca gcg aga gcc tgg tgc cag gtg 96  
 Ser Gly Asp Pro Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val  
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ctg ctg cca gcc t <sup>g</sup> t gaa gga gaa agg ccc act ctc gca ttt ctg caa Leu Leu Pro Ala Cys Glu Gly Arg Pro Thr Leu Ala Phe Leu Gln 100 105 110	336
gat gta atg aac att ttg ctt cag tac gtg gtg aaa agt ttt gat aga Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg 115 120 125	384
tca act aaa gtg att gat ttc cat tac ccc aat gag ctt ctt caa gag Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu 130 135 140	432
tat aat tgg gaa ttg gca gac caa ccg caa aat ctg gag gaa att ttg Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu 145 150 155 160	480
acg cac tgc caa aca act cta aaa tat gcg att aaa aca ggg cat ccc Thr His Cys Gln Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro 165 170 175	528
cga tat ttt aat cag ctg tct acc gga ttg gat atg gtt gga tta gca Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala 180 185 190	576
gca gat tgg ttg aca tca aca gca aac acg aac atg ttt acc tat gag Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu 195 200 205	624
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aag atg ttt cca gaa gtc aag gaa aag ggg atg gcg gcg gtg ccc agg Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Val Pro Arg 260 265 270	816
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gaa gtc aaa cag aaa gga ttt gtt cct ttc ctg gtg agt gcc aca gct Glu Val Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala 325 330 335			1008
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ccc ttg caa tgt tcg gct ctc ctg gtc aga gag gag gga ctg atg cag Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln 405 410 415			1248
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tat gac ctg tcc tat gac acg gga gac aag gcc ttg cag tgt gga cgc Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg 435 440 445			1344
cac gtc gat gtc ttt aaa tta tgg ctc atg tgg aga gca aag ggg act His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr 450 455 460			1392
act gga ttt gaa gct cac att gat aag tgt ttg gag ctg gca gag tat Thr Gly Phe Glu Ala His Ile Asp Lys Cys Leu Glu Leu Ala Glu Tyr 465 470 475 480			1440
tta tac aat atc att aaa aac cga gaa gga tat gaa atg gtg ttc gat Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp 485 490 495			1488
ggg aag cct cag cac aca aat gtc tgc ttc tgg ttt gta cct cct agt Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Phe Val Pro Pro Ser 500 505 510			1536
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Val Ala Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met		
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Val Ser Tyr Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val		
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Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu		
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580	585	

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35 40 45		
Tyr Gly Asp Ser Glu Lys Pro Ala Glu Ser Gly Gly Ser Val Thr Ser		
50 55 60		
Arg Ala Ala Thr Arg Lys Val Ala Cys Thr Cys Asp Gln Lys Pro Cys		
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Ser Cys Pro Lys Gly Asp Val Asn Tyr Ala Leu Leu His Ala Thr Asp		
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Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg		
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145 150 155 160		
Thr His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro		
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Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala		
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Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu		
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Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser		
225 230 235 240		
Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Leu Ile Ala Arg Tyr		
245 250 255		
Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Val Pro Arg		
260 265 270		
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Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys		

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Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp		
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Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Asn Gly Val		
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Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val		
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Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln		
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Ser Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His		
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Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg		
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His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr		
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Thr Gly Phe Glu Ala His Ile Asp Lys Cys Leu Glu Leu Ala Glu Tyr		
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Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp		
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Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Phe Val Pro Pro Ser		
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Ser Gly Asp Ser Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val
 20          25          30          .

gct cag aag ttc acg ggc ggc atc gga aac aaa ctg tgc gcc ctg ctc 144
Ala Gln Lys Phe Thr Gly Gly Ile Gly Asn Lys Leu Cys Ala Leu Leu
 35          40          45          .

tac gga gac gcc gag aag ccg gcg gag agc ggc ggg agc caa ccc ccg 192
Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Ser Gln Pro Pro
 50          55          60          .

cgg gcc gcc gcc cggtt aag gcc gcc tgc gcc tgc gac cag aag ccc tgc 240
Arg Ala Ala Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys
 65          70          75          80          .

agc tgc tcc aaa gtg gat gtc aac tac gcg ttt ctc cat gca aca gac 288
Ser Cys Ser Lys Val Asp Val Asn Tyr Ala Phe Leu His Ala Thr Asp
 85          90          95          .

ctg ctg ccg gcg tgt gat gga gaa agg ccc act ttg gcg ttt ctg caa 336
Leu Leu Pro Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln

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tca acc aaa gtg att gat ttc cat tat cct aat gag ctt ctc caa gaa Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu	130	135	432
		140	
tat aat tgg gaa ttg gca gac caa cca caa aat ttg gag gaa att ttg Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu	145	150	480
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atg cat tgc caa aca act cta aaa tat gca att aaa aca ggg cat cct Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro	165	170	528
		175	
aga tac ttc aat caa ctt tct act ggt ttg gat atg gtt gga tta gca Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala	180	185	576
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gca gac tgg ctg aca tca aca gca aat act aac atg ttc acc tat gaa Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu	195	200	624
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		235	
ccc ggt ggc gcc ata tct aac atg tat gcc atg atg atc gca cgc ttt Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe	245	250	768
		255	
aag atg ttc cca gaa gtc aag gag aaa gga atg gct gct ctt ccc agg Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg	260	265	816
		270	
ctc att gcc ttc acg tct gaa cat agt cat ttt tct ctc aag aag gga Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly	275	280	864
		285	
gct gca gcc tta ggg att gga aca gac agc gtg att ctg att aaa tgt Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys	290	295	912
		300	
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		315	
gaa gcc aaa cag aaa ggg ttt gtt cct ttc ctc gtg agt gcc aca gct Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala	325	330	1008
		335	
gga acc acc gtg tac gga gca ttt gac ccc ctc tta gct gtc gct gac			1056

Gly	Thr	Thr	Val	Tyr	Gly	Ala	Phe	Asp	Pro	Leu	Leu	Ala	Val	Ala	Asp	
			340			345						350				
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Ile	Cys	Lys	Lys	Tyr	Lys	Ile	Trp	Met	His	Val	Asp	Ala	Ala	Trp	Gly	
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ggg	gga	tta	ctg	atg	tcc	cga	aaa	cac	aag	tgg	aaa	ctg	agt	ggc	gtg	1152
Gly	Gly	Leu	Leu	Met	Ser	Arg	Lys	His	Lys	Trp	Lys	Leu	Ser	Gly	Val	
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gag	agg	gcc	aac	tct	gtg	acg	tgg	aat	cca	cac	aag	atg	atg	gga	gtc	1200
Glu	Arg	Ala	Asn	Ser	Val	Thr	Trp	Asn	Pro	His	Lys	Met	Met	Gly	Val	
			385			390						395			400	
cct	ttg	cag	tgc	tct	gct	ctc	ctg	gtt	aga	gaa	gag	gga	ttg	atg	cag	1248
Pro	Leu	Gln	Cys	Ser	Ala	Leu	Leu	Val	Arg	Glu	Glu	Gly	Leu	Met	Gln	
			405			410								415		
aat	tgc	aac	caa	atg	cat	gcc	tcc	tac	ctc	ttt	cag	caa	gat	aaa	cat	1296
Asn	Cys	Asn	Gln	Met	His	Ala	Ser	Tyr	Leu	Phe	Gln	Gln	Asp	Lys	His	
			420			425						430				
tat	gac	ctg	tcc	tat	gac	act	gga	gac	aag	gcc	tta	cag	tgc	gga	cgc	1344
Tyr	Asp	Leu	Ser	Tyr	Asp	Thr	Gly	Asp	Lys	Ala	Leu	Gln	Cys	Gly	Arg	
			435			440						445				
cac	gtt	gat	gtt	ttt	aaa	cta	tgg	ctg	atg	tgg	agg	gca	aag	ggg	act	1392
His	Val	Asp	Val	Phe	Lys	Leu	Trp	Leu	Met	Trp	Arg	Ala	Lys	Gly	Thr	
			450			455						460				
acc	ggg	ttt	gaa	gcg	cat	gtt	gat	aaa	tgt	ttg	gag	ttg	gca	gag	tat	1440
Thr	Gly	Phe	Glu	Ala	His	Val	Asp	Lys	Cys	Leu	Glu	Leu	Ala	Glu	Tyr	
			465			470						475			480	
tta	tac	aac	atc	ata	aaa	aac	cga	gaa	gga	tat	gag	atg	gtg	ttt	gat	1488
Leu	Tyr	Asn	Ile	Ile	Lys	Asn	Arg	Glu	Gly	Tyr	Glu	Met	Val	Phe	Asp	
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ggg	aag	cct	cag	cac	aca	aat	gtc	tgc	ttc	tgg	tac	att	cct	cca	agc	1536
Gly	Lys	Pro	Gln	His	Thr	Asn	Val	Cys	Phe	Trp	Tyr	Ile	Pro	Pro	Ser	
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ttg	cgt	act	ctg	gaa	gac	aat	gaa	gag	aga	atg	agt	cgc	ctc	tcg	aag	1584
Leu	Arg	Thr	Leu	Glu	Asp	Asn	Glu	Glu	Arg	Met	Ser	Arg	Leu	Ser	Lys	
			515			520						525				
gtg	gct	cca	gtg	att	aaa	gcc	aga	atg	atg	gag	tat	gga	acc	aca	atg	1632
Val	Ala	Pro	Val	Ile	Lys	Ala	Arg	Met	Met	Glu	Tyr	Gly	Thr	Thr	Met	
			530			535						540				
gtc	agc	tac	caa	ccc	ttg	gga	gac	aag	gtc	aat	ttc	ttc	cgc	atg	gtc	1680
Val	Ser	Tyr	Gln	Pro	Leu	Gly	Asp	Lys	Val	Asn	Phe	Phe	Arg	Met	Val	
			545			550						555			560	
atc	tca	aac	cca	gcg	gca	act	cac	caa	gac	att	gac	ttc	ctg	att	gaa	1728
Ile	Ser	Asn	Pro	Ala	Ala	Thr	His	Gln	Asp	Ile	Asp	Phe	Leu	Ile	Glu	
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 Glu Ile Glu Arg Leu Gly Gln Asp Leu \*  
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 Ser Gly Asp Ser Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val  
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 35 40 45  
 Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro  
 50 55 60  
 Arg Ala Ala Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys  
 65 70 75 80  
 Ser Cys Ser Lys Val Asp Val Asn Tyr Ala Phe Leu His Ala Thr Asp  
 85 90 95  
 Leu Leu Pro Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln  
 100 105 110  
 Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg  
 115 120 125  
 Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu  
 130 135 140  
 Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu  
 145 150 155 160  
 Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro  
 165 170 175  
 Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala  
 180 185 190  
 Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu  
 195 200 205  
 Ile Ala Pro Val Phe Val Leu Leu Glu Tyr Val Thr Leu Lys Lys Met  
 210 215 220  
 Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser  
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 Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe  
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 Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg  
 260 265 270  
 Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly  
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 Asp Glu Arg Gly Lys Met Ile Pro Ser Asp Pro Glu Arg Arg Ile Leu  
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 Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala  
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 Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp  
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 Ile Cys Lys Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala Trp Gly  
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 Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly Val  
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Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val  
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Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln  
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Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His  
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Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg  
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His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr  
450 455 460  
Thr Gly Phe Glu Ala His Val Asp Lys Cys Leu Glu Leu Ala Glu Tyr  
465 470 475 480  
Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp  
485 490 495  
Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser  
500 505 510  
Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys  
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Glu Ile Glu Arg Leu Gly Gln Asp Leu  
580 585